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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/898,601 | 07/03/2001 | Eric Austin | NOR / 865B | 3051 |

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EXAMINER

DAVIS, ROBERT B

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1722

DATE MAILED: 09/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/898,601

Applicant(s)

AUSTIN ET AL.

Examiner

Robert B. Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it is more than 150 words in length. Correction is required. See MPEP § 608.01(b).

2. The disclosure is objected to because of the following informalities:

On lines 11-12 of page 9, "in an 38 opposite wall 34" should be "in an opposite wall".

Appropriate correction is required.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 28. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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5. Claims 1-6 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Fugere et al (6,119,895: figures 1-9; column 1, lines 11-15, column 1, line 63 to column 2, line 38; column 2, line 63 to column 6, line 30). The Patent has an effective 35 USC 119(e) filing date of Provisional Application 60/062,027 as of October 10, 1997.

Fugere et al teach an apparatus for vacuum encapsulation of a semiconductor chip package, comprising: a dispense chamber (100) having an inlet end, an outlet end and a material dispenser (20) mounted therein operable to dispense encapsulant material about peripheral edges of a semiconductor chip package under at least partial vacuum of the dispense chamber during a dispense cycle; an inlet chamber (122) mounted adjacent the inlet end of said dispense chamber and isolatable therefrom, said inlet chamber including a transport mechanism (138) operable to transfer a semiconductor chip package (142C in figure 9) to the dispense chamber under at least partial vacuum of said inlet chamber and said dispense chamber; an outlet chamber (124) mounted adjacent the outlet end of said dispense chamber and isolatable therefrom, said outlet chamber including a transport mechanism (138) operable to receive a semiconductor chip package (142A in figure 9) onto which encapsulant material has been dispensed from said dispense chamber under at least partial vacuum of said outlet chamber and said dispense chamber; and a vent (column 5, lines 59-62) connected to said outlet chamber for venting said outlet chamber to atmosphere, whereby upon venting said outlet chamber to atmosphere, the dispensed encapsulant material is forced into the semiconductor chip package to form an encapsulation layer therein. The reference teaches individual controllers for controlling the conveyors

(column 4, lines 59-67) and each of the chambers connected to a vacuum pump system (column 4, lines 54-58). The reference further teaches a conveyor (139) in the dispensing chamber for moving the chip assembly, door assemblies (126B, 126C) at the inlet and outlet of the dispensing chamber for isolating the dispensing chamber from the inlet and outlet chambers.

6. Claims 1-4, 7 and 8 rejected under 35 U.S.C. 102(a) as being anticipated by Lawing ("Preventing Voids in μ BGA™ Packages", Chip Scale Review, pp. 48-51).

Fugere et al teach an apparatus for vacuum encapsulation of a semiconductor chip package, comprising: a dispense chamber (figure 3) having an inlet end, an outlet end and a material dispenser mounted therein operable to dispense encapsulant material about peripheral edges of a semiconductor chip package under at least partial vacuum of the dispense chamber during a dispense cycle, the dispense chamber has a material feed station and a dwell station (Table 1, step 4 and page 51, columns 2 and 3 under heading "Multi-Chamber Processing Advantages" wherein the encapsulant is allowed to flow up to and around the edges of the chips; an inlet chamber (figure 3) mounted adjacent the inlet end of said dispense chamber and isolatable therefrom, said inlet chamber including a transport mechanism (see step 3 of Table 1 and page 51, first full paragraph) operable to transfer a semiconductor chip package to the dispense chamber under at least partial vacuum of said inlet chamber and said dispense chamber; an outlet chamber (figure 3) mounted adjacent the outlet end of said dispense chamber and isolatable therefrom, said outlet chamber including a transport mechanism (step 8, Table 1 and page 51, first full paragraph) operable to receive a semiconductor

chip package onto which encapsulant material has been dispensed from said dispense chamber under at least partial vacuum of said outlet chamber and said dispense chamber; and a vent (purge-valve assembly page 51, first full paragraph) connected to said outlet chamber for venting said outlet chamber to atmosphere, whereby upon venting said outlet chamber to atmosphere, the dispensed encapsulant material is forced into the semiconductor chip package to form an encapsulation layer therein. The reference also teaches doors 1-4 at the beginning, end and connections of the respective three chambers.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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9. Claims 7, 8, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fugere et al taken together with Lawing.

Fugere et al disclose all claimed features except for a dispensing chamber, which has a dispensing station and a dwell station and a vent that is a valve.

Lawing discloses a vacuum encapsulation apparatus having a dispensing chamber with a dispensing station and a dwell station and a vent, which is a valve assembly.

It would have been obvious at the time of the invention to one of ordinary skill in the art to modify the apparatus of Fugere et al by having a dispensing chamber which has a dispensing station and a dwell station as disclosed by Lawing for the purpose of allowing the encapsulant to flow up and around the edge of the chips without adding more time to the production sequence at the dispensing station. It would have been further obvious to use a valve as disclosed by Lawing for the purpose of allowing automatic control of the vacuum release in the outlet chamber.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining references show various apparatus for pressure swing encapsulation of a semiconductor chip assembly.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert B. Davis whose telephone number is 703-308-2625. The examiner can normally be reached on Monday-Friday 9-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 703-308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

A handwritten signature in black ink, appearing to read 'Robert B. Davis', with a long horizontal flourish extending to the right.

Robert B. Davis
Primary Examiner
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9/15/03